SRI SARADA COLLEGE FOR WOMEN (AUTONOMOUS)

Reaccredited with B++ Grade by NAAC

(Affiliated to Periyar University)

Salem – 636 016.

DEPARTMENT OF STATISTICS

ADVANCED DIPLOMA

COURSE IN

STATISTICAL METHODS

I Year	**Certificate Course**	Statistical Methods – I
II Year	**Diploma Course**	Statistical Methods – II
III Year	**Advanced Diploma Course**	Data Analysis Using R.

ADVANCED DIPLOMA COURSE IN STATISTICS
CERTIFICATE COURSE : STATISTICAL METHOD – I

Total Hours : 100 **Syllabus**

Objectives:

Students will be able to gain knowledge in basic Statistical Methods and their applications.

UNIT I: **Hours: 20**

Definition of Statistics – Uses and limitations of Statistics – Measures of Central tendency: Criteria of a good average – Mean, Median and Mode – Merits and Demerits – Simple problems.

UNIT-II: **Hours: 20**

Measures of Dispersion: Criteria of good measures of dispersion – Range – Quartile deviation – Standard deviation – Coefficient of Variation – Simple problems.

Skewness – Types of skewness – Karl Pearson's and Bowley's coefficients of skewness – Simple problems – Definition of kurtosis – Fitting of linear and Quadratic equations.

UNIT - III: **Hours: 20**

Correlation: Types of correlation – Scatter diagram – Karl Pearson's correlation coefficient for ungrouped data – Spearman's rank correlation coefficient – Simple problems

Regression analysis: Uses of regression analysis – Regression coefficients – Regression equations for ungrouped data- Simple problems.

UNIT IV: **Hours: 20**

Introduction to probability theory – Random experiments - Events - Sample space – Classical and Axiomatic approach to probability – Conditional Probability – Independence of events – Bayes theorem – Simple problem.

Random variables – Discrete and Continuous Random Variables – Probability Mass function and Probability Density function - Mathematical Expectation of a random variable.

UNIT V: **Hours: 20**

Discrete Distributions: Bernoulli, Binomial, Poisson and their characteristic properties – Simple problems.

Continuous distributions: Uniform, Normal, Exponential distributions and their characteristic properties – Simple problems.

Books for study and reference

D. N. Elhance, Veena Elhance & B.M. Aggarwal: Fundamentals of Statistics
S.P. Gupta: Statistical Methods.
DC. Sanchetti & V. K .Kapoor: Fundamentals of Statistics..

DIPLOMA COURSE: STATISTICAL METHODS – II

Total Hours : 100

Syllabus

Objectives:

Students will be able to learn about the common methods of sampling, testing of statistical hypothesis and analysis of variance.

UNIT I: Hours: 20

Sampling: Definitions of population and sample – Census method – Merits of Sampling – Methods of Sampling: Simple random sampling – Stratified random sampling – Systematic sampling – Cluster sampling – Judgement sampling – Quota sampling – Convenience sampling.

UNIT-II: Hours: 20

Null and alternative hypotheses – Type I and Type II errors – Critical region and acceptance region – Level of Significance – One –tailed and two-tailed tests – Sampling distribution and standard error – Procedure of testing of hypothesis – Large sample tests for single proportion, difference of two proportions, single mean and difference of two means – Simple problems.

UNIT - III: Hours:20

Assumptions in t-test – t-tests for single mean and difference of two means – Paired t- test and t-test for correlation coefficient – Simple problems – Contingency Table – 2x2 contingency table – Conditions for the validity of Chi-square test – Chi-square tests of homogeneity and independence of two attributes – Simple problems.

UNIT IV: Hours:20

Analysis of Variance – Definition and uses – ANOVA for one-way classification – ANOVA for two-way classification – Simple problems. NSSO and CSO and their functions.

UNIT V: Hours: 20

Index numbers: Definition and uses – Main steps in the construction of index numbers – Weighted Index Numbers: Laspeyre's, Paasche's, Fisher's, Marshall-Edgeworth index numbers – Time and Factor Reversal Test – Fixed and Chain base index numbers – Construction and uses of cost of living index numbers.

Vital Statistics: Measures of mortality – crude and specific rates – infant mortality rate – direct and indirect standardization of death rates

Books for study and reference

S.C. Gupta and V.K. Kapoor: Fundamentals of Applied Statistics.

S.C. Gupta and V.K. Kapoor: Fundamentals of Mathematical Statistics..

ADVANCED DIPLOMA COURSE : DATA ANALYSIS USING R.

Total Hours : 100

Syllabus

Objectives:

Students will be able to analyse data using R.

1. Basics of R Programming.
2. Data validation – Transform, Sorting, Select case.
3. Importing data from Excel.
4. Diagrammatic representation.
5. Measures of Central tendency & dispersion.
6. Karl Pearson's correlation – Rank correlation
7. Simple linear regression.
8. Fitting of Distribution
9. Generation of random sample
10. Large Sample:
    - Test for single proportion
    - Test for difference of proportions
    - Test for single mean
    - Test for difference of mean
11. Small sample:
    - Test for single mean
    - Test for difference of mean
    - Paired t- test
12. Chi-square test.
13. One and Two way ANOVA.

Books for study and reference

Sandip Rakshit (2017), R Programming for Beginners, McGraw Hill Education; First edition